Tennessee
Arnold AFB

Facility and Location

Arnold Air Force Base (AFB) is one of three test centers within the Air Force Materiel Command. It supports the development of aerospace systems by testing hardware in the Arnold Engineering Development Center, the largest flight simulation test facility in the world. The center operates aerodynamic and propulsion wind tunnels, rocket motor and turbine engine test cells, space environmental chambers, arc heaters, ballistic ranges, and other specialized units. Rocket propulsion systems are tested to measure thrust, propellant burning, nozzle control, shutdown characteristics, and ignition.

The Agency for Toxic Substances and Disease Registry (ATSDR) completed a public health assessment in June 2000. In its assessment, ATSDR reported on two Installation Restoration Program sites that had the potential for perchlorate releases: Solid Waste Management Unit (SWMU) 15 Chemical Treatment Pond and SWMU 98 Explosive Ordnance Disposal (EOD) Range.

SWMU 15 Chemical Treatment Pond is a three acre unlined pond located south of the retention reservoir that was used from 1961 to 1988 for disposal of solvents, acids, and other industrial wastes. No elevated levels of perchlorate were reported. SWMU 98 EOD Range consists of an open area, approximately 150 feet in diameter, located southwest of the airfield used for the disposal of explosive materials. For safety reasons, explosive materials, including solid propellant containing perchlorate, are placed in six foot deep trenches prior to open detonation.

Drinking water is provided by the base for the main test area and by the city of Estill Springs. The source of drinking water is surface water for the main test area and groundwater upgradient from the solid waste management units.

Media Sampled and Findings

Groundwater — In 2011, 10 of 18 samples detected perchlorate from 0.01 to 14 ppb. In 2010, 32 of 38 samples detected perchlorate from 0.09 to 270 ppb. In 2009, 25 of 32 samples detected perchlorate from 0.1 to 600 ppb. In 2008, 16 of 24 samples detected perchlorate from 0.06 to 830 ppb. In 2007, 15 of 25 samples detected perchlorate from 0.05 to 650 ppb. Prior to 2007, 12 of 27 samples taken from monitoring wells adjacent to and downstream from SWMU 98 as well as surface water and springs downgradient from the site detected perchlorate from an estimated 2.7 to 1,000 ppb.
Spring — In 2007, three of three samples detected perchlorate from 0.07 to 0.63 ppb. Prior to 2007, two of six samples detected perchlorate from 0.23 to 0.28 ppb.
Surface Water — In 2007, two of two samples detected perchlorate at 0.06 and 0.14 ppb.

Appropriate Actions

Current groundwater samples were below the EPA and DoD Preliminary Remediation Goal (PRG) of 15 ppb.

A Resource Conservation and Recovery Act (RCRA) Facility Investigation and a Corrective Measures Study were completed in June 2008 with a recommended corrective action alternative of in situ bioremediation. A treatability study was performed in the spring of 2008 that focused on evaluating the effectiveness of a sodium lactate injection to create conditions in the shallow aquifer that would support the biodegradation of perchlorate in groundwater beneath the former EOD range. A post substrate injection perchlorate monitoring and characterization project will support a further evaluation of the effectiveness of the sodium lactate in reducing perchlorate concentrations and whether additional injections should be considered.

Groundwater monitoring wells at shallow, intermediate, and deep depths are currently being sampled adjacent to and down gradient from SWMU 98, as well as surface water and springs down gradient of this site. The shallow groundwater samples underneath SWMU 98 are the only detections above the PRG. 2011 groundwater concentrations were below 15 ppb. The installation will continue sampling at SWMU 98 to monitor perchlorate concentrations.